

Smart Grid Privacy

NARUC Webinar

June 10, 2011

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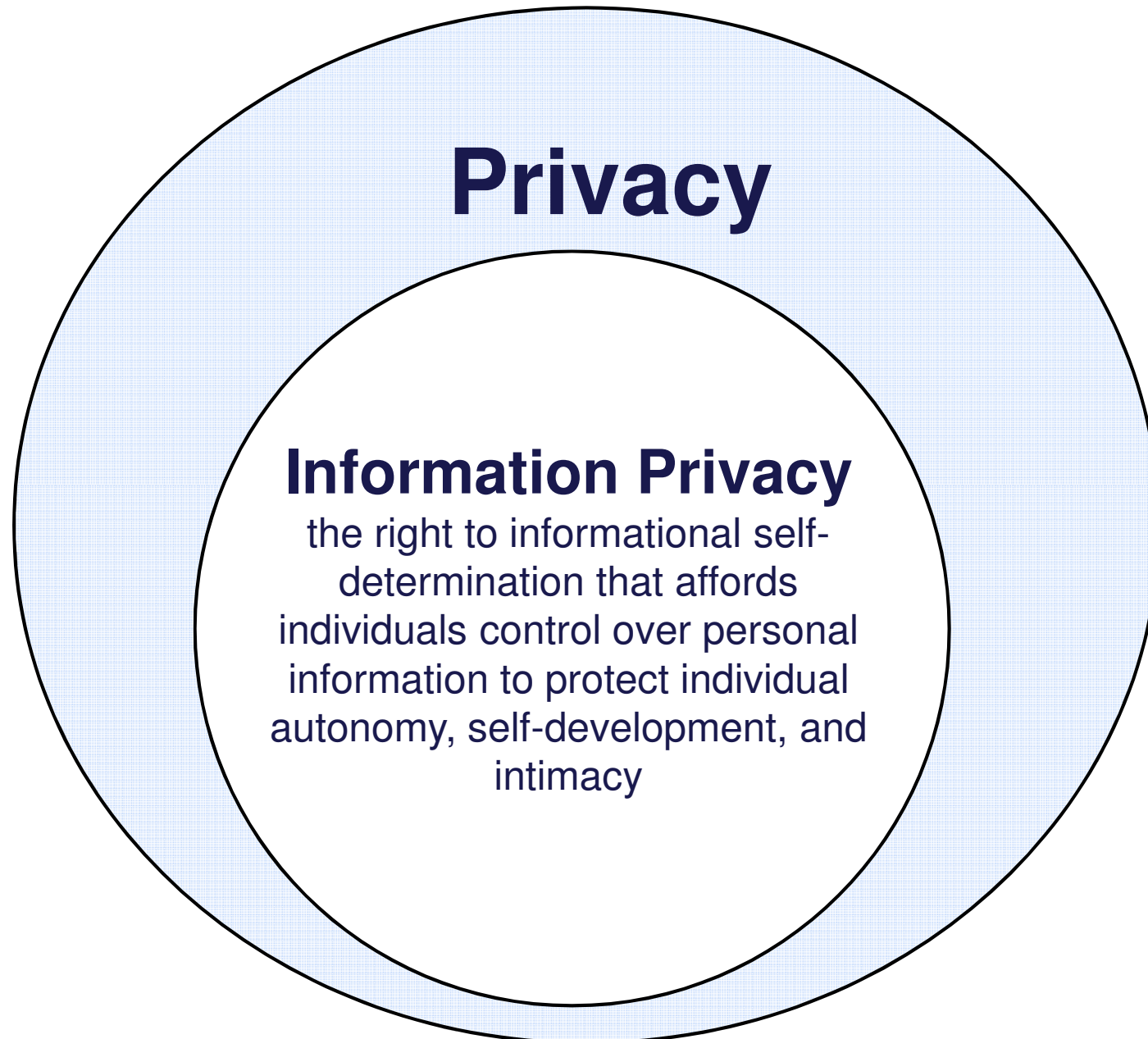
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- ❑ **Privacy: Information Privacy**
- ❑ **Smart Grid**
 - **New Information Flows**
 - **New Entities**
 - **Gaps in legal/regulatory framework**
- ❑ **CPUC decision**
- ❑ **Discussion**



Fair Information Practices (FIP) Principles



§2. Transparency – organizations should provide notice to individuals regarding their use, disclosure, and retention of personally identifiable information (PII).

§3. Purpose Specification – organizations should seek individual consent to collect, disclose, and retain PII.

§4. Individual Participation – organizations should articulate specific purposes for collecting PII, and specific uses for PII they collect.

§5. Data Minimization – organizations should collect only PII that is “directly relevant and necessary to accomplish the specified purpose(s)” and retain data no longer than necessary.

§6. Use & Disclosure Limitation: organizations should use PII only for the purposes stated in their notices.

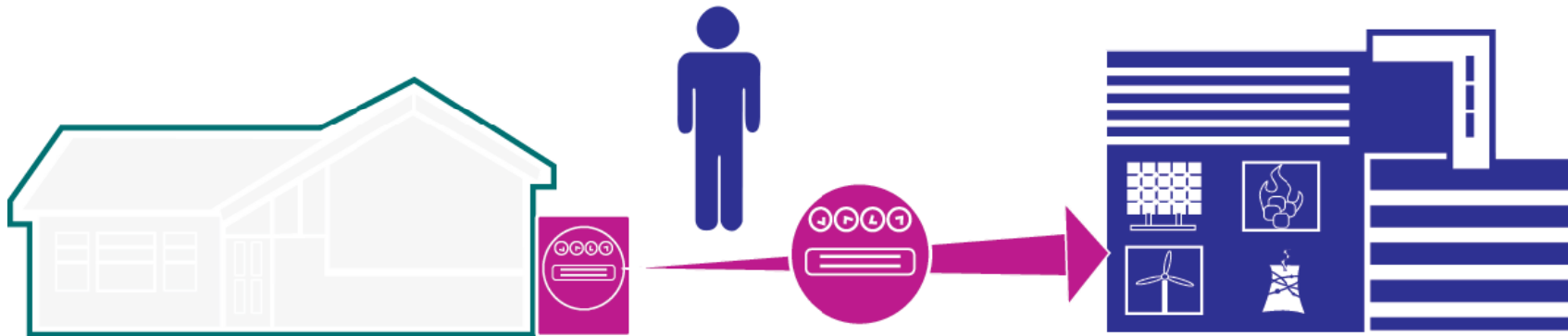
§7. Data Quality & Integrity: organizations should keep PII accurate, relevant, timely, and complete.

§8. Data Security – organizations should implement adequate safeguards to protect against loss, unauthorized use, modification, and unintended disclosure.

§9. Accountability & Auditing – organizations should audit employees’ and contractors’ actual use of PII, to ensure compliance with the other FIPs.

- ☐ **Source of Data**
- ☐ **Recipient**
- ☐ **Use**
- ☐ **Mechanism of transmission**
- ☐ **Nature of the data (explicit and implicit)**

Electromechanical meter to utility



Smart Meter to Utility

Protections against unauthorized access

- Computer Fraud and Abuse Act (CFAA)
- Similar state statutes
- State specific utility statutes and regulations
- State Security Breach Notification Statutes

- Computer Fraud and Abuse Act (CFAA)
- Similar state statutes



- Federal Wiretap Act
- State Wiretap Statutes

Smart Meter to Utility

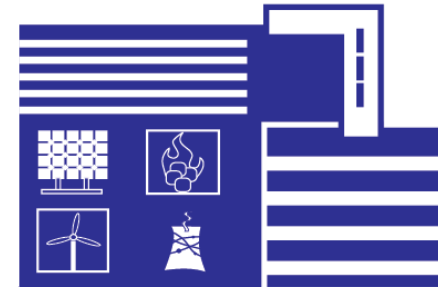
Rules constraining lawful access

- State statutes
- State constitutions

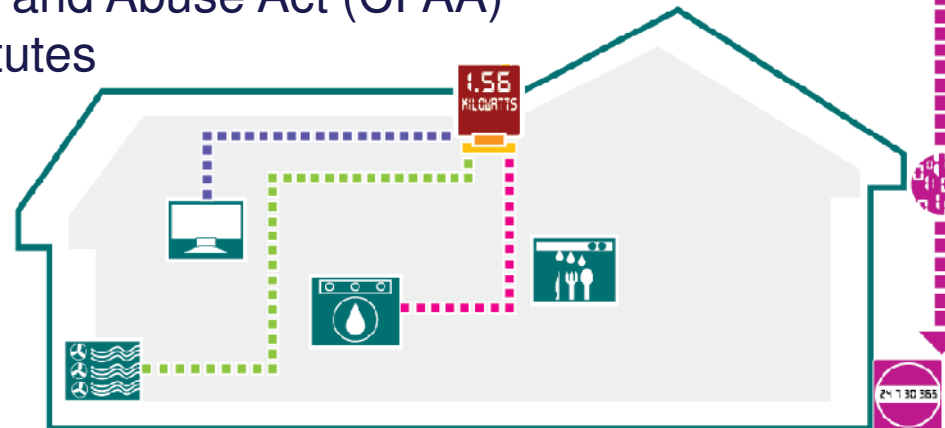


Customer-owned Meter

- Computer Fraud and Abuse Act (CFAA)
- Similar state statutes
- State specific utility statutes and regulations
- State security breach notification statutes



- Computer Fraud and Abuse Act (CFAA)
- Similar state statutes

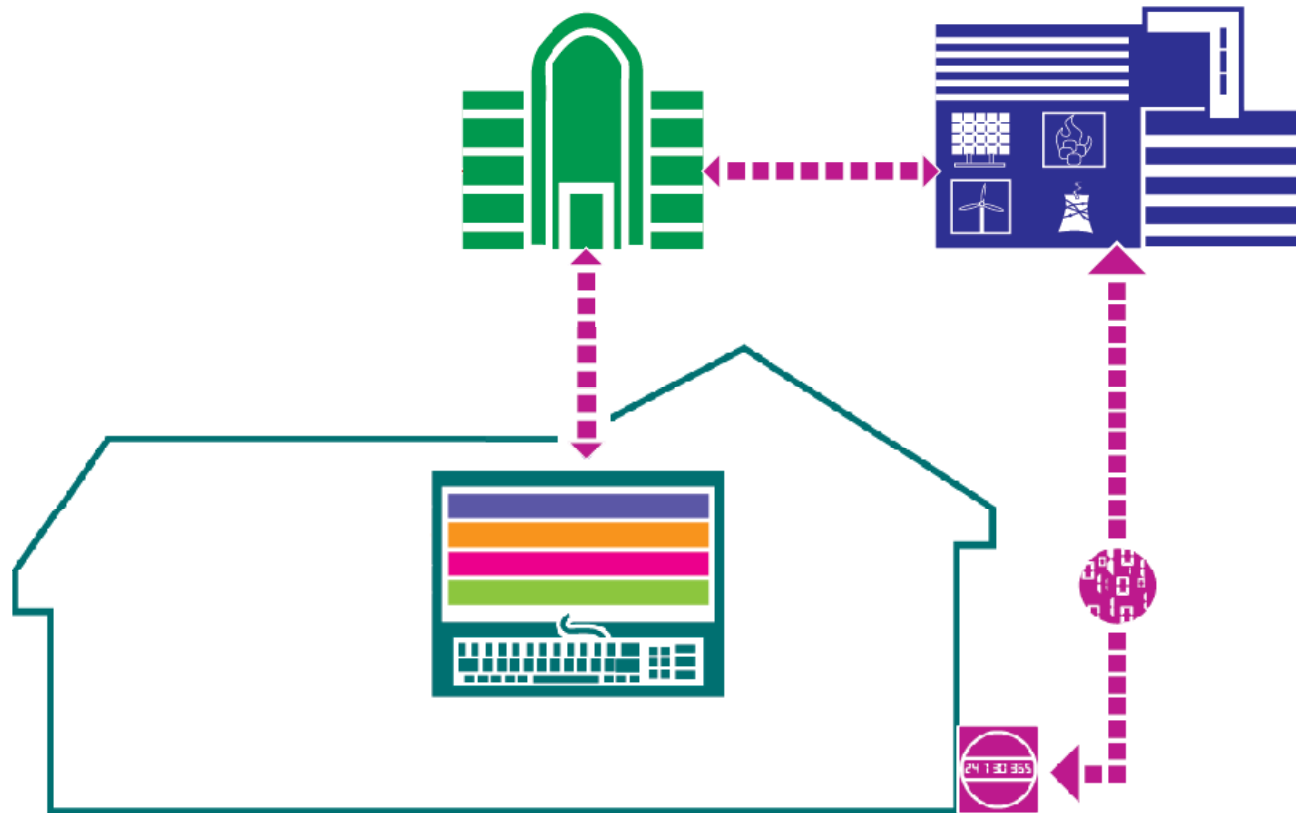


- Federal Wiretap Act
- State Wiretap Statutes

A customer-owned meter (shown at top of house), separate from the utility-owned smart meter, gathers usage data and sends it to internal home network devices. The data does not leave the house.

A customer-owned meter (shown at top of house), separate from the utility-owned smart meter, sends usage data to a third party.

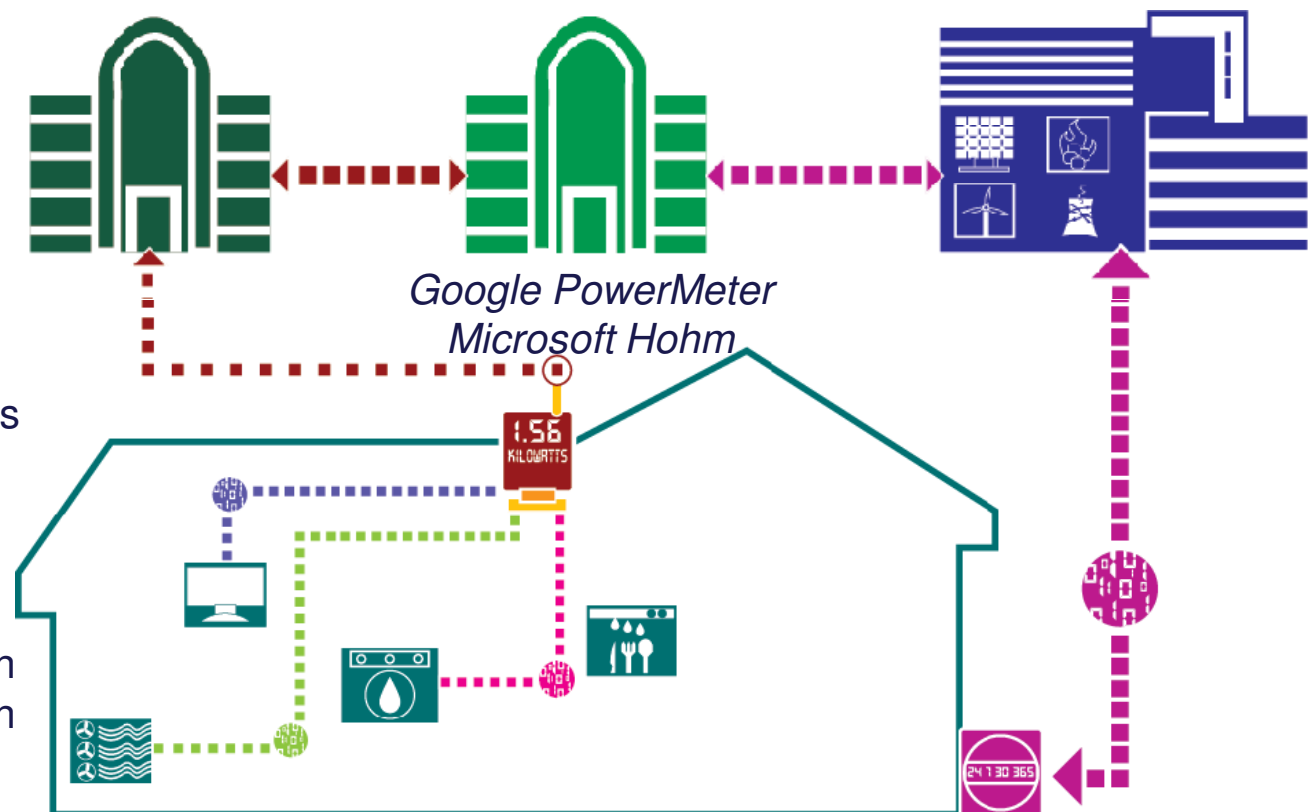
Customer-authorized third party access to data from utility



No personal meter — e.g. Google gets customer data from utility based on customer authorization.

Third party access authorized by customer

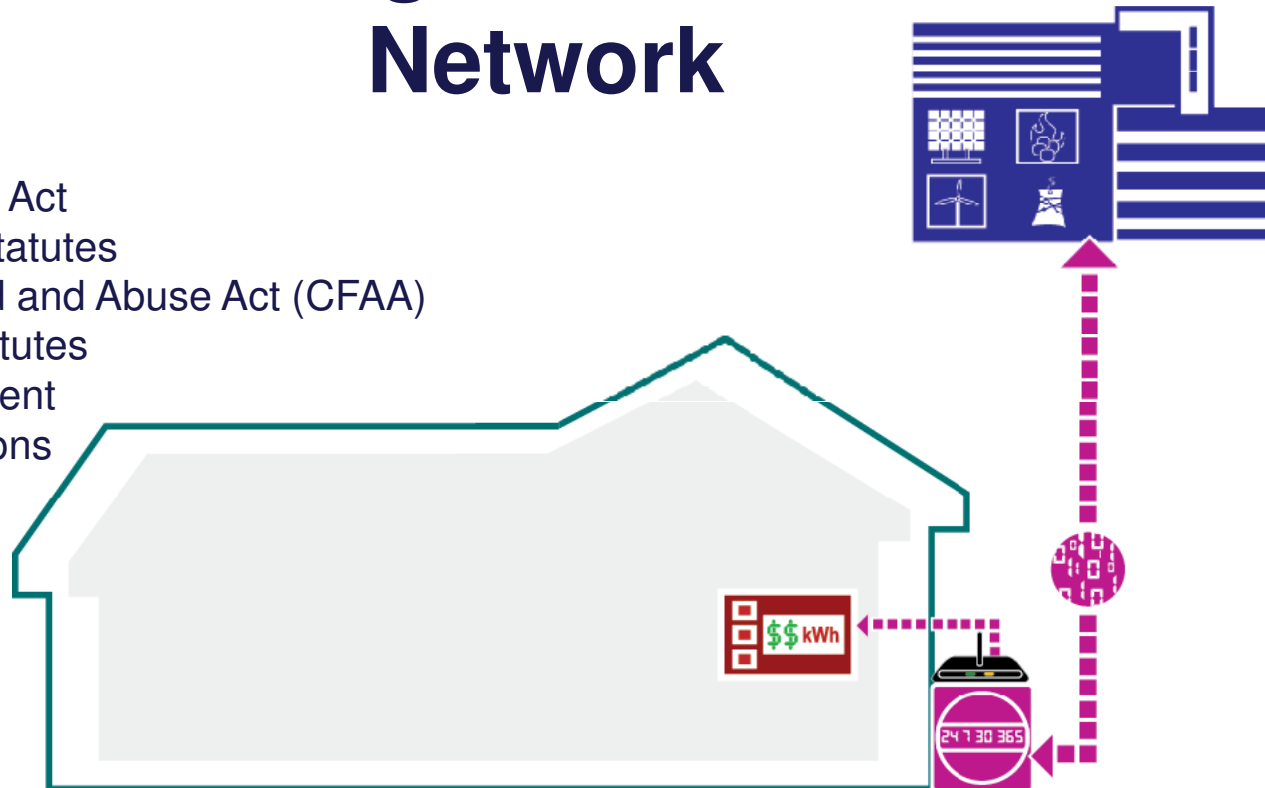
- Computer Fraud and Abuse Act (CFAA)
- Similar state statutes
- State security breach notification statutes
- Unclear coverage under state specific utility statutes and regulations
- Federal Trade Commission
- State Consumer Protection
- Stored Communications Act (SCA)



- ❑ **Privacy and Innovation**
 - **Tracking and Monitoring**
 - **Registration**
 - **Demand Response and Load Control**
 - **Pricing, Messaging, and Billing Information**

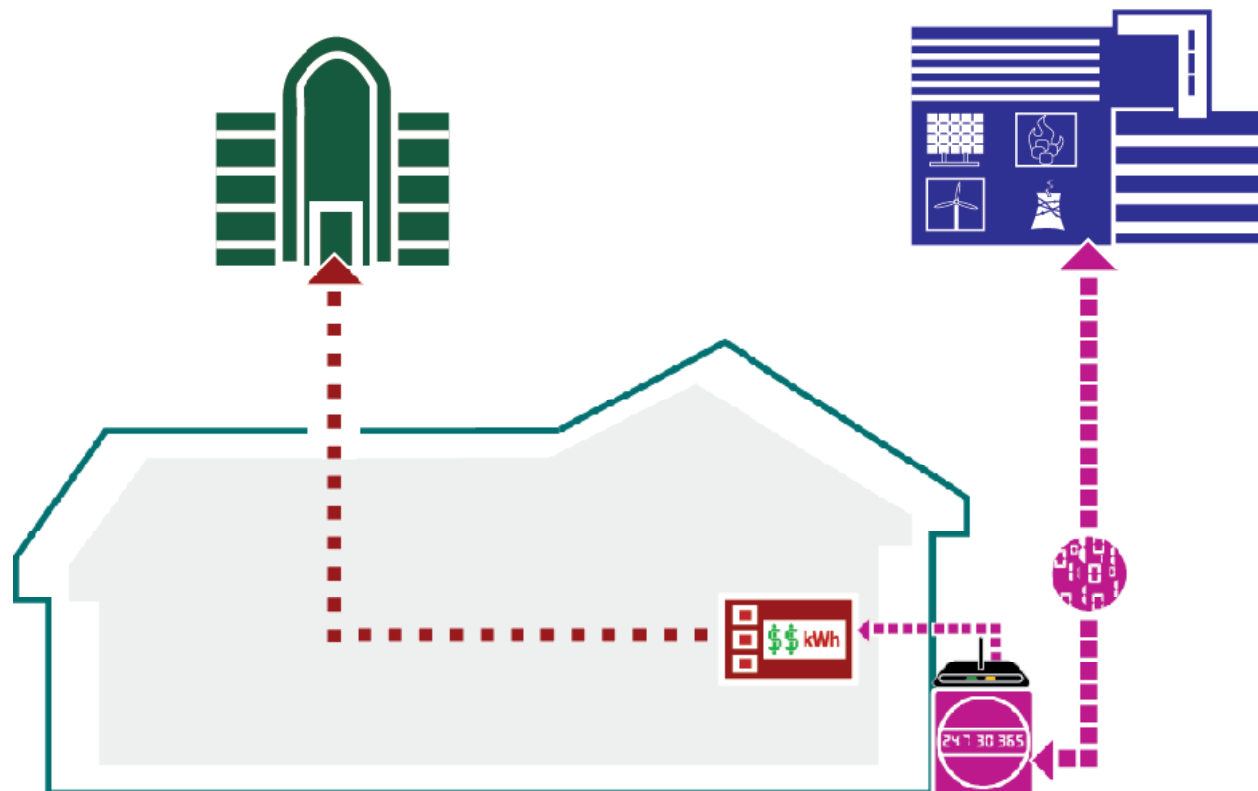
Real-time usage data in Home Area Network

- Federal Wiretap Act
- State Wiretap Statutes
- Computer Fraud and Abuse Act (CFAA)
- Similar state statutes
- Fourth Amendment
- State Constitutions

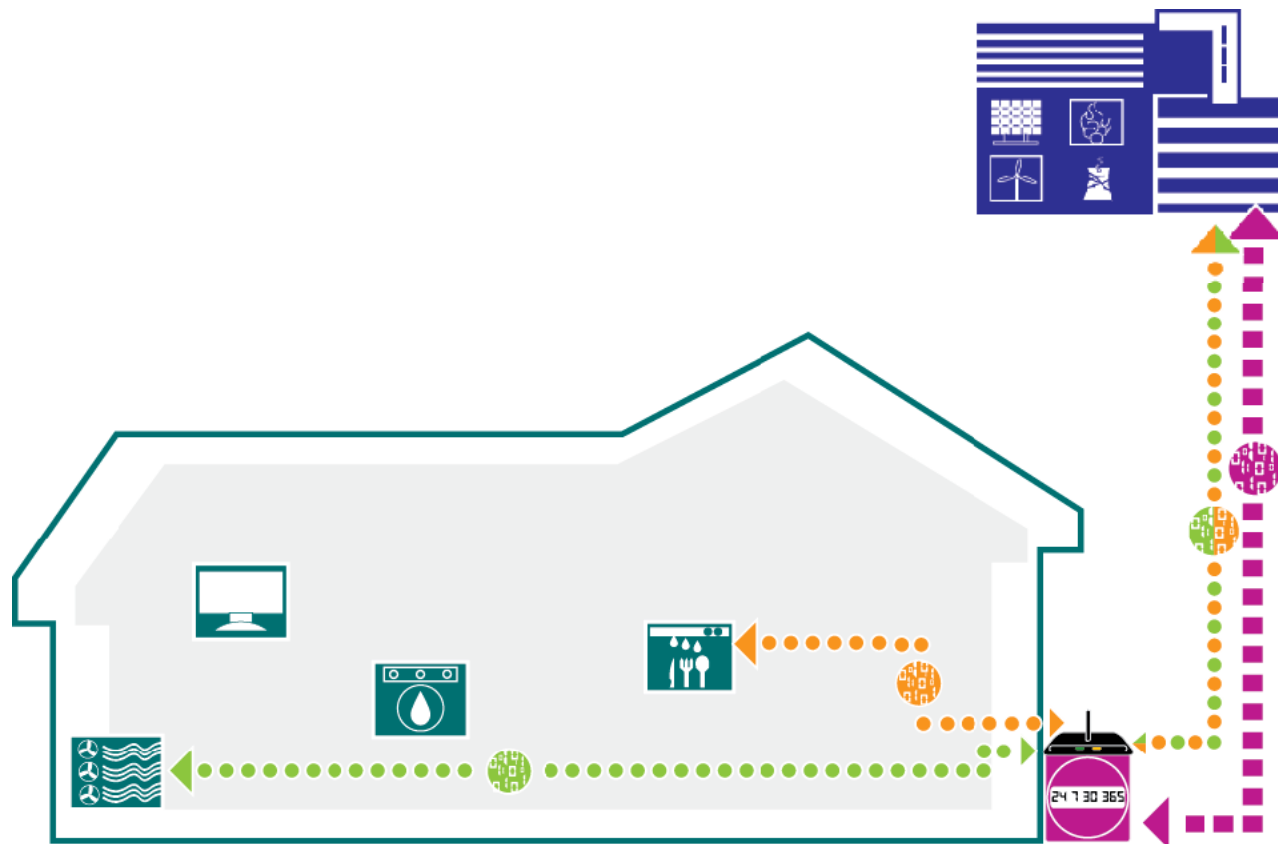


A HAN gateway (black device attached to the smart meter), sends energy usage information to an in-home display, which presents real-time energy consumption and price information to the customer.

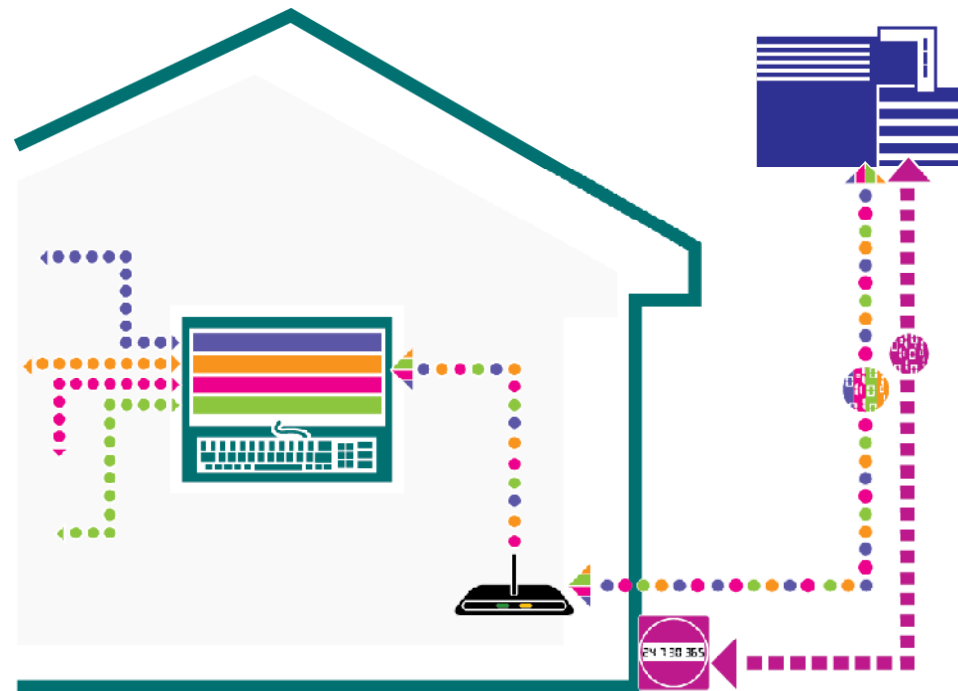
Data shared with a third party from HAN via home device



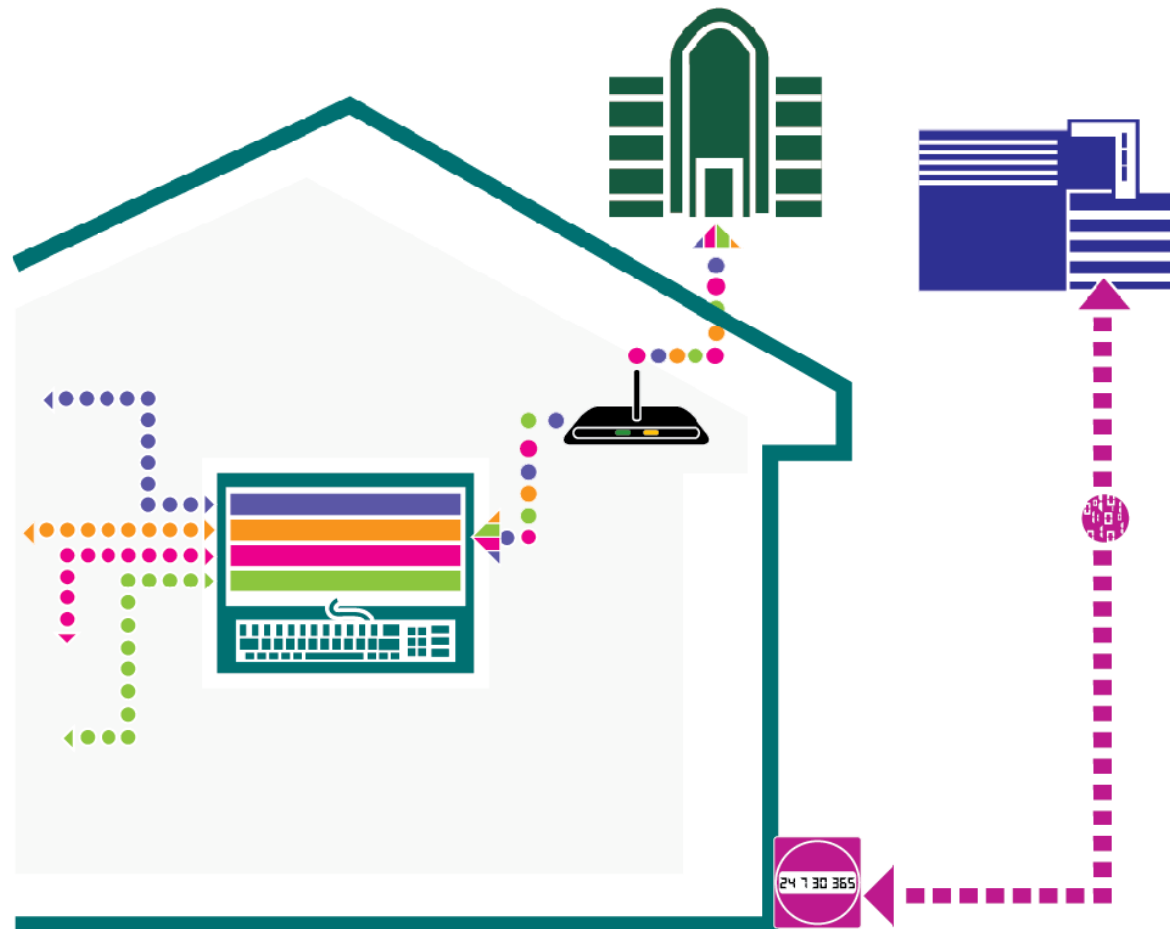
Demand Response & Load Control: Direct Utility-HAN communication



Customer-owned Energy Management System



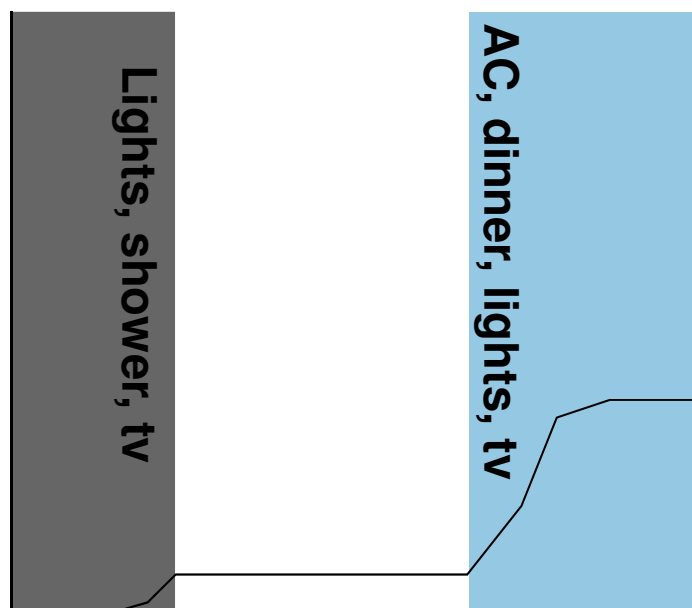
Third-party Energy Management System



Interval Data



- 3000 data points per month for 15-minute intervals
– vs. 1
- Virtual biography of household activity in near real-time
- Adding specific appliance data (e.g., smart dryers, PEVs) adds even more detail



Daily Patterns

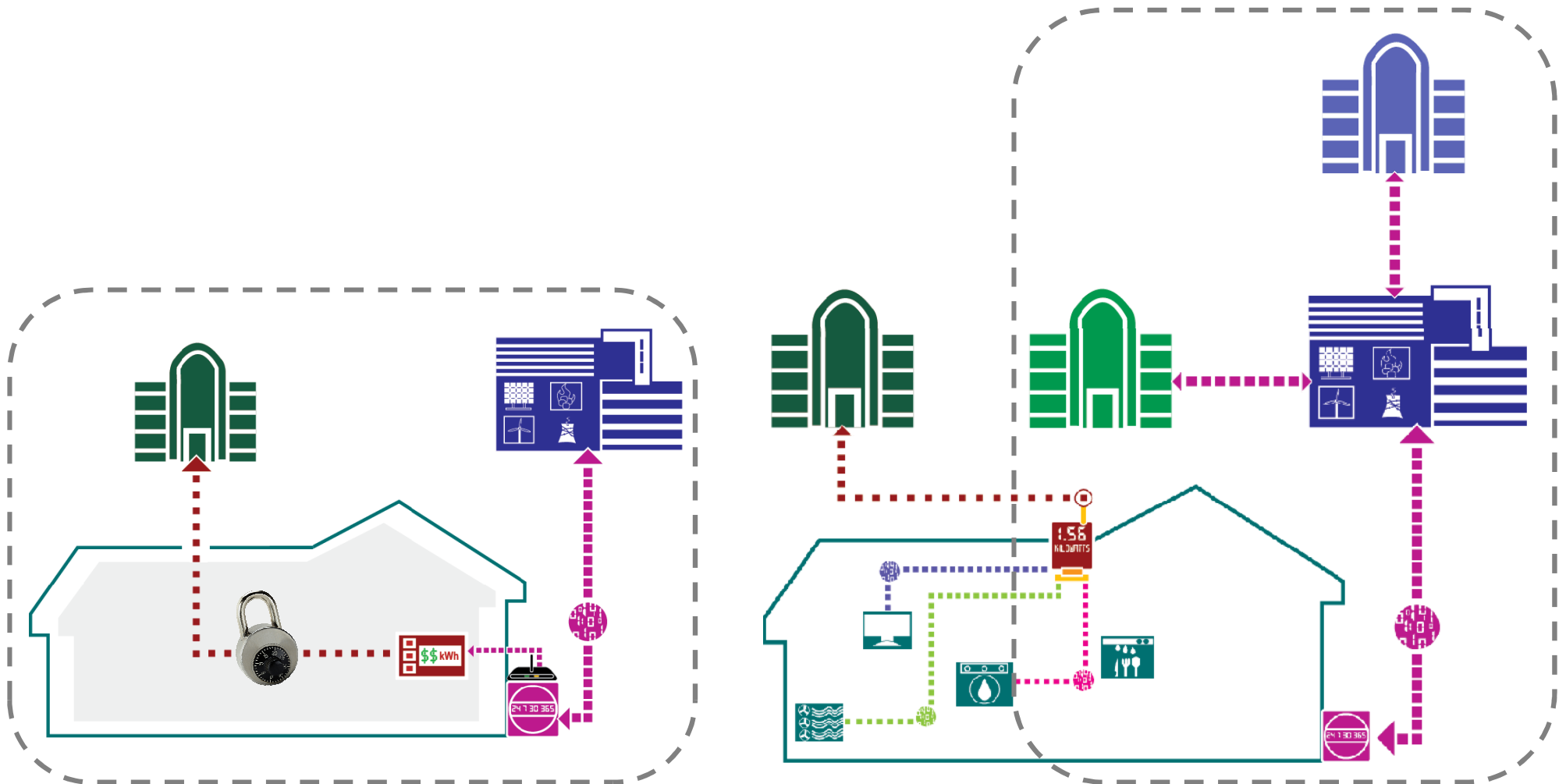


Weekly Patterns

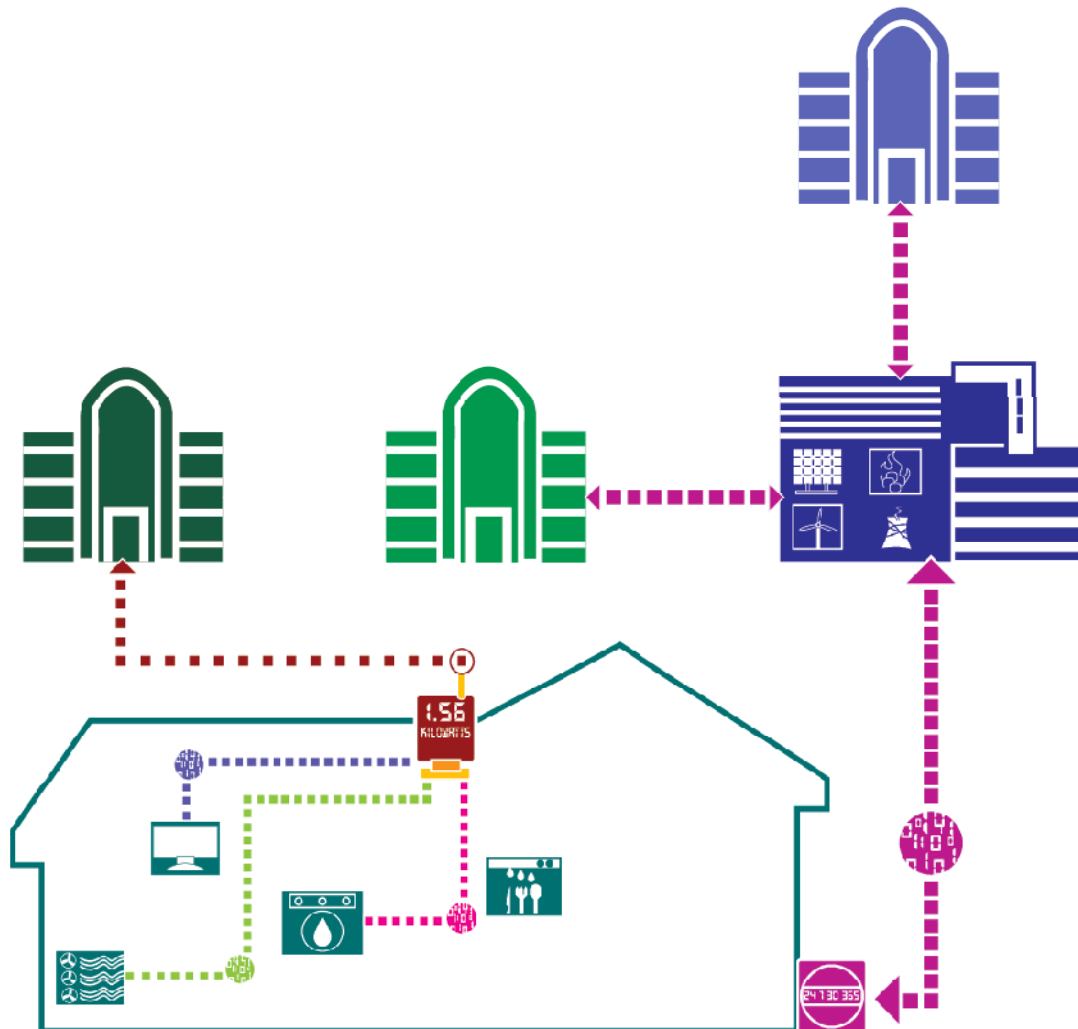
CPUC Proposed Decision

May, 2011

§1. Who Is Covered?



§1. Definitions

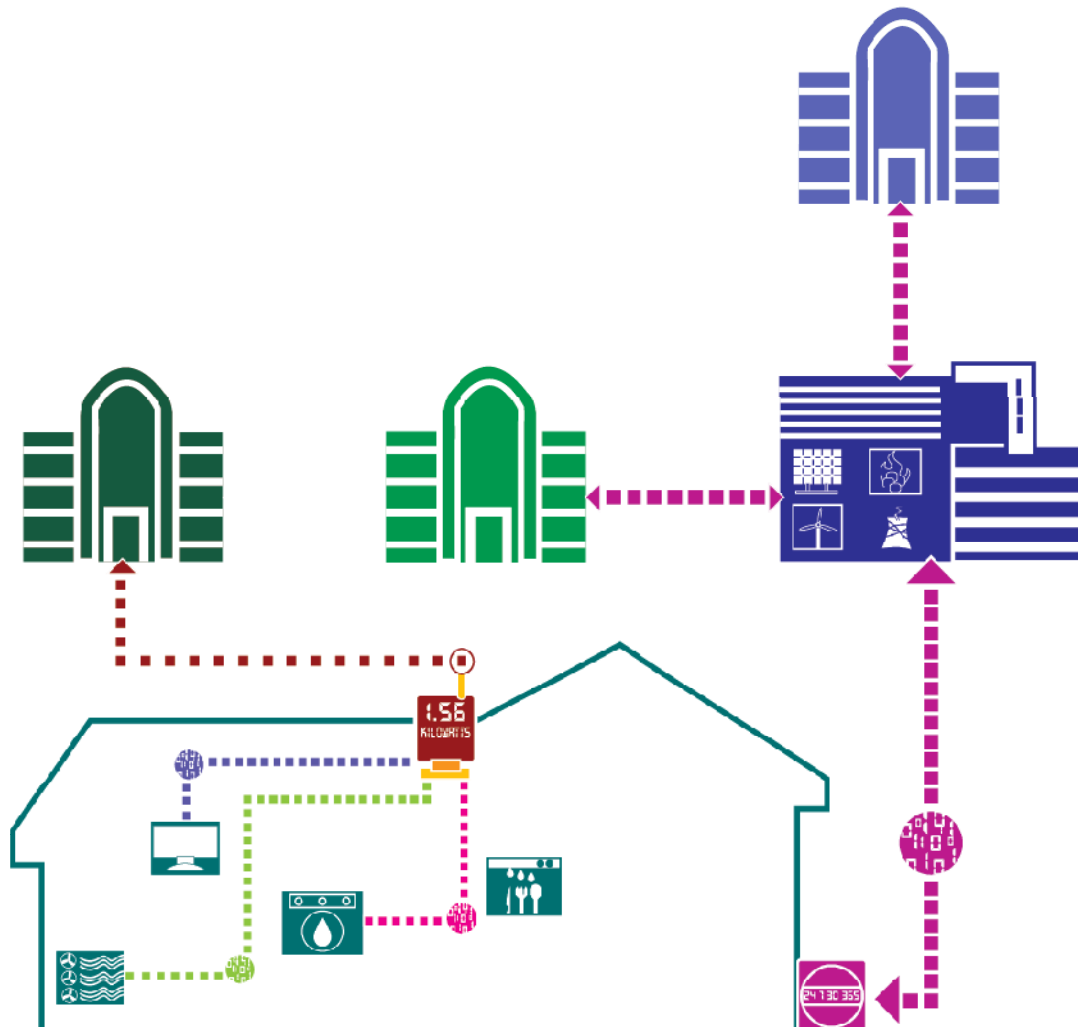


(a): **Covered Entity:** electrical corporations and third parties who obtain information via the utility or a “locked” device.

((b) **Customer:** Recipient of retail generation, distribution or transmission service (ongoing discussion re “entity”).

(c): **Covered Information:** usage information obtained through AML *if* it is associated with any information that can reasonably be used to identify a customer; does not cover information that cannot be reasonably identified or re-identified.

§2. Transparency



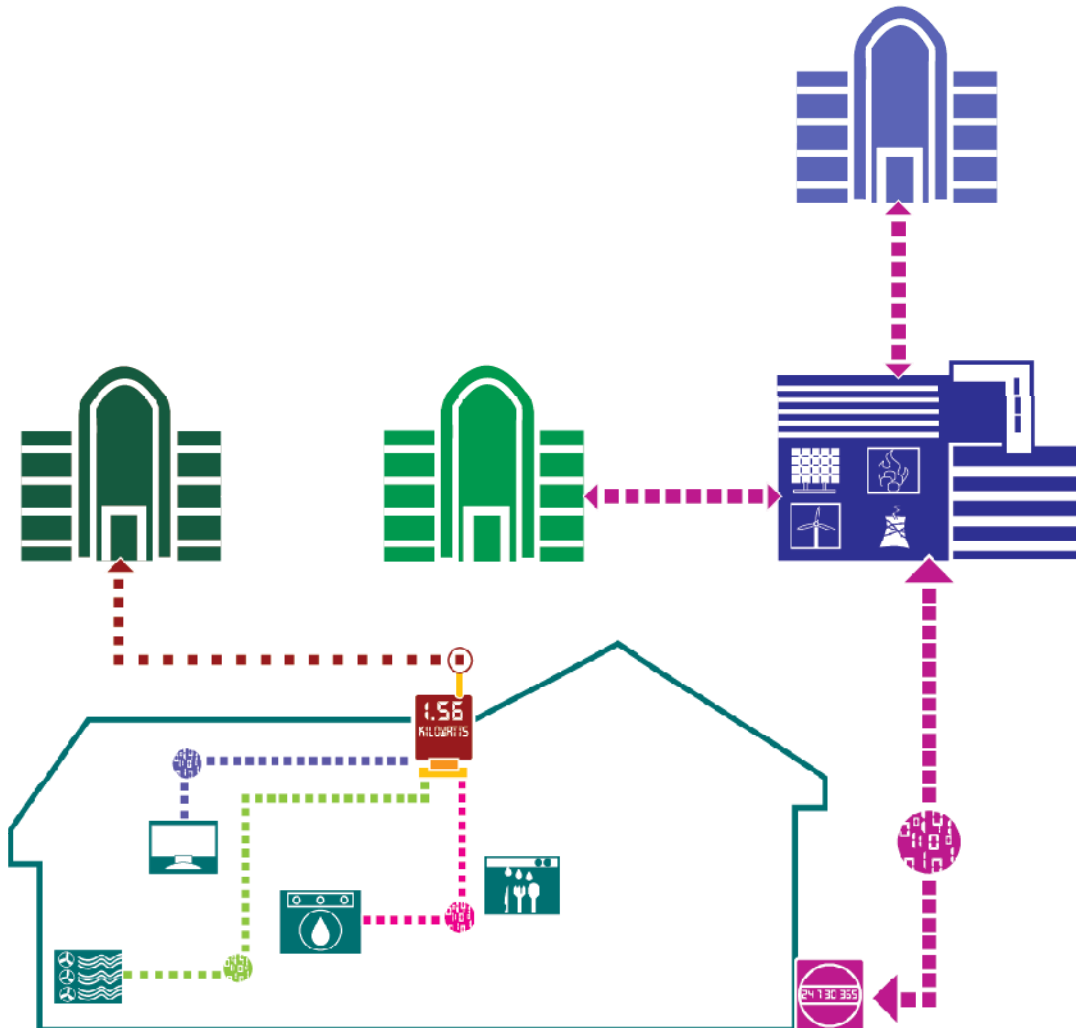
(a): Must provide customers with “clear, accurate, and specific notice regarding the collection, storage, use, and disclosure of covered information.”

- There are requirements for when notice must be provided and, notably, what must be included in the notice

§3. Purpose Specification

Must provide

- (a)(1): What categories of information are information stored and reasonably specific purposes for why it is stored
- (a)(2): What categories of information are provided to third parties and purpose; some information about third parties
- (b): How long information is retained
- (c) Information on means or dispute or minimization by customer

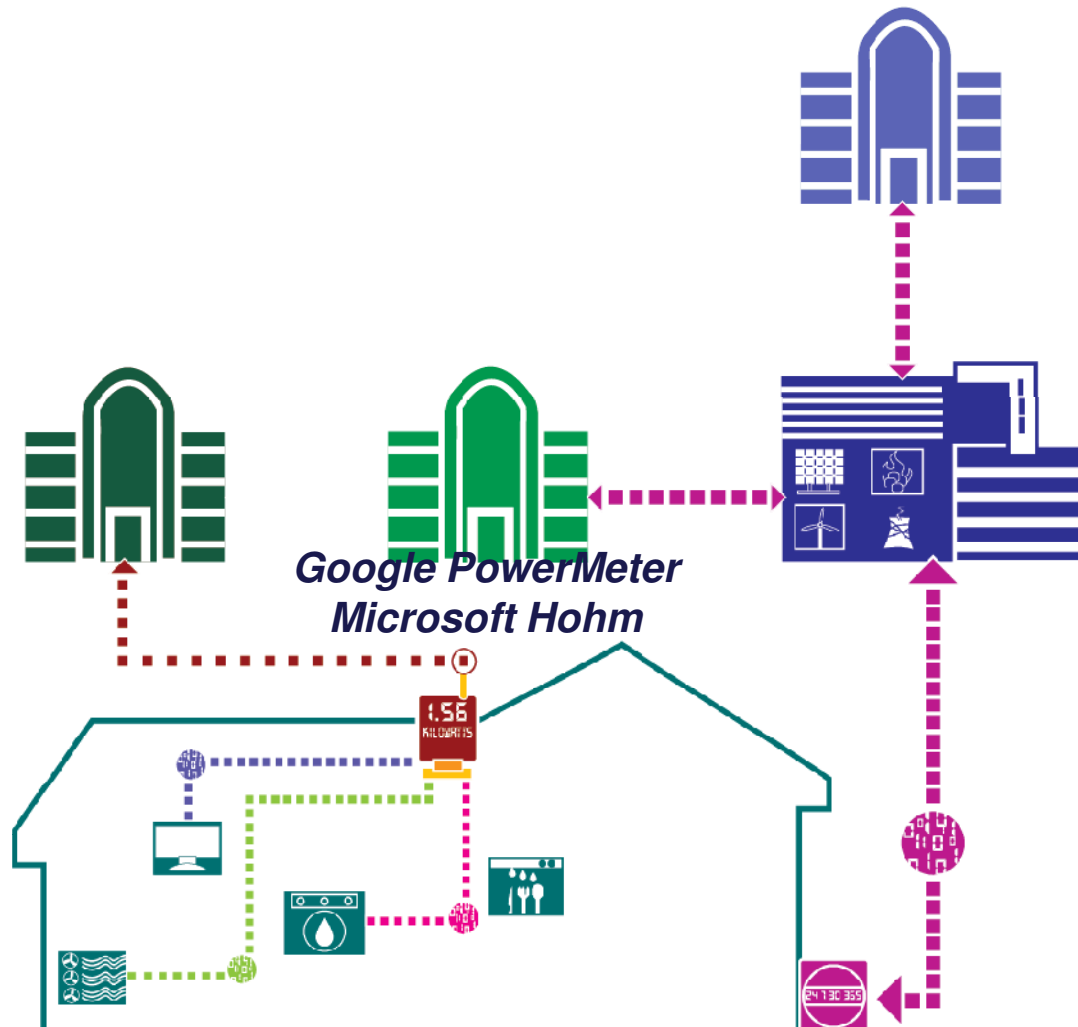


§4. Individual Participation

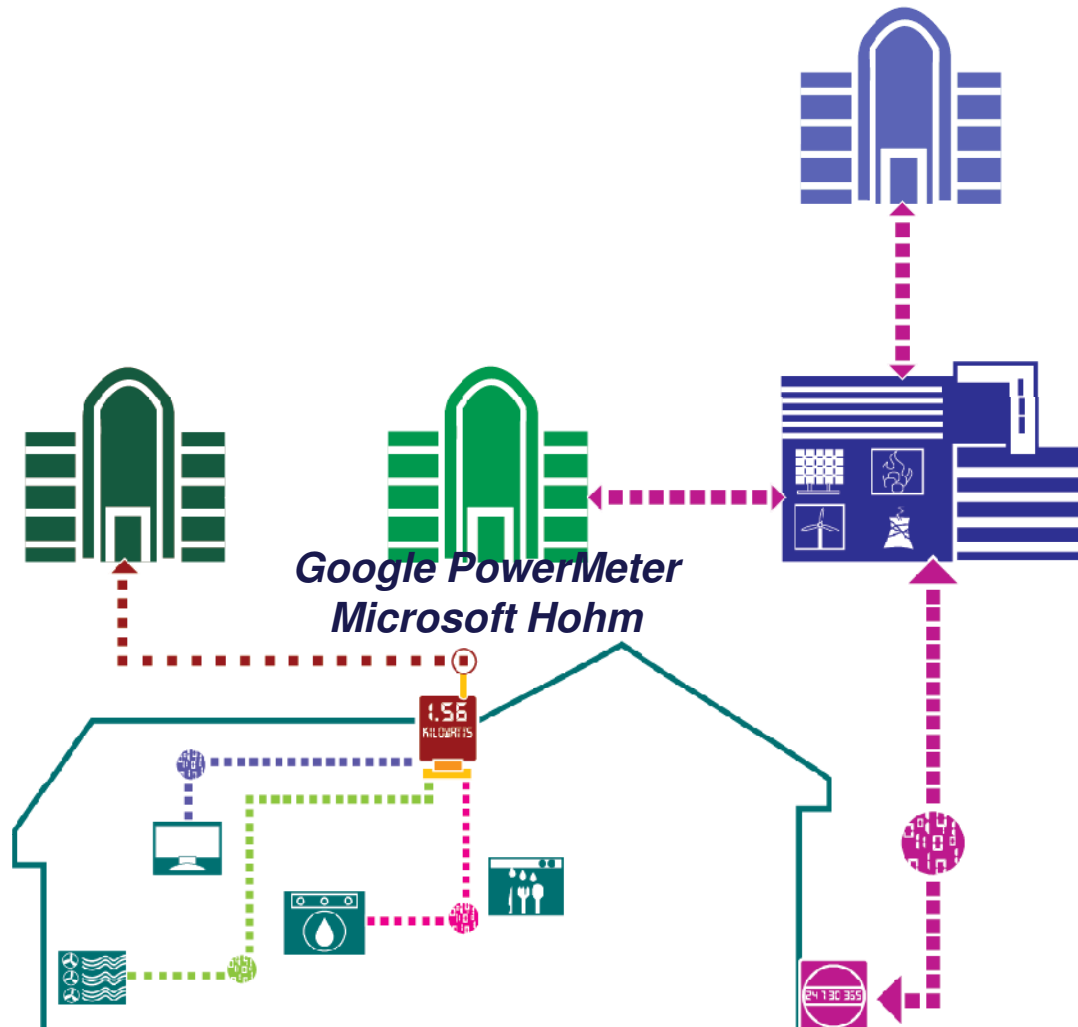
(a) Customers have access to their covered information

(b)(1): Customers have the right to grant or revoke secondary uses of covered information, to dispute accuracy, and request corrections

(c) Rules for Legal Process



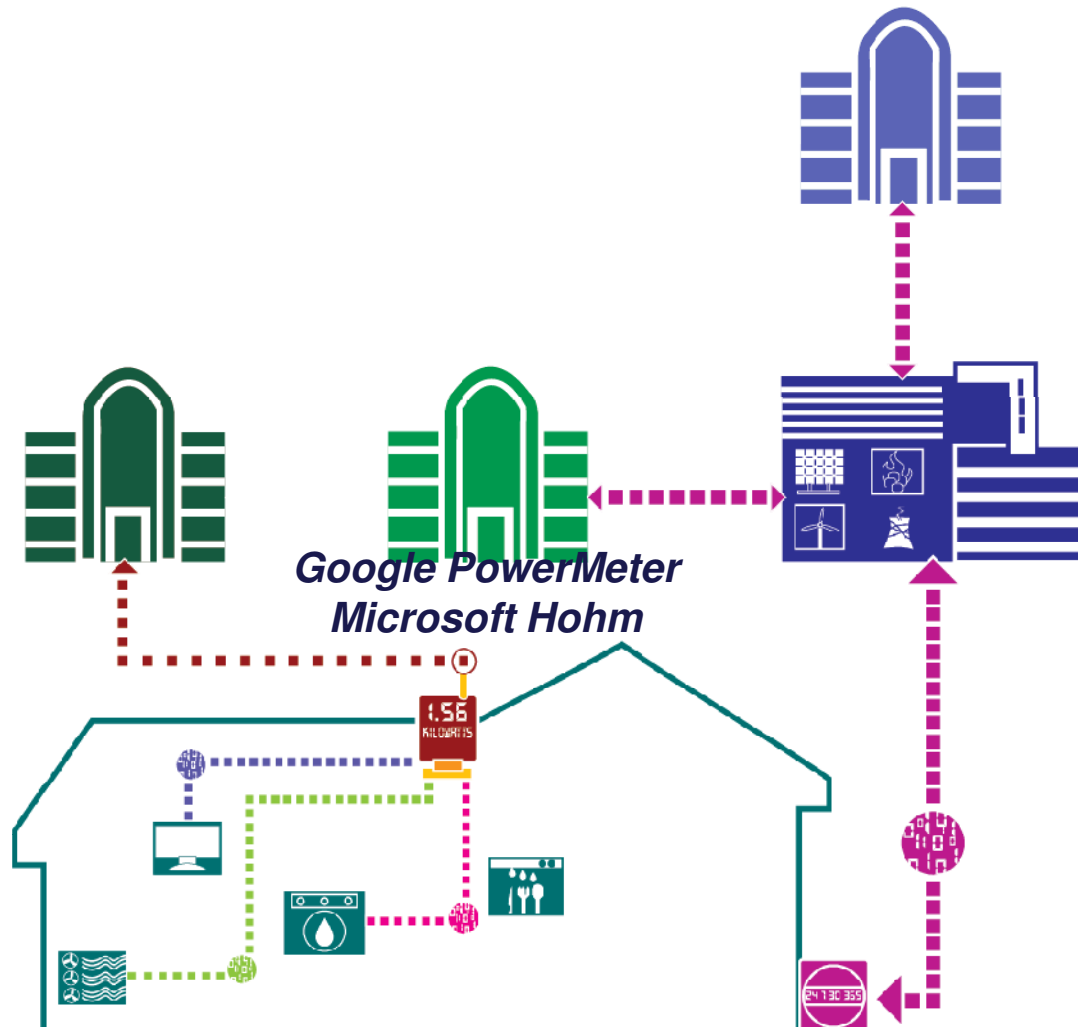
§5. Data Minimization



(a): “collect, store, use, and disclose only as much covered information as is reasonably necessary”

(b): “maintain covered information only for as long as reasonably necessary”

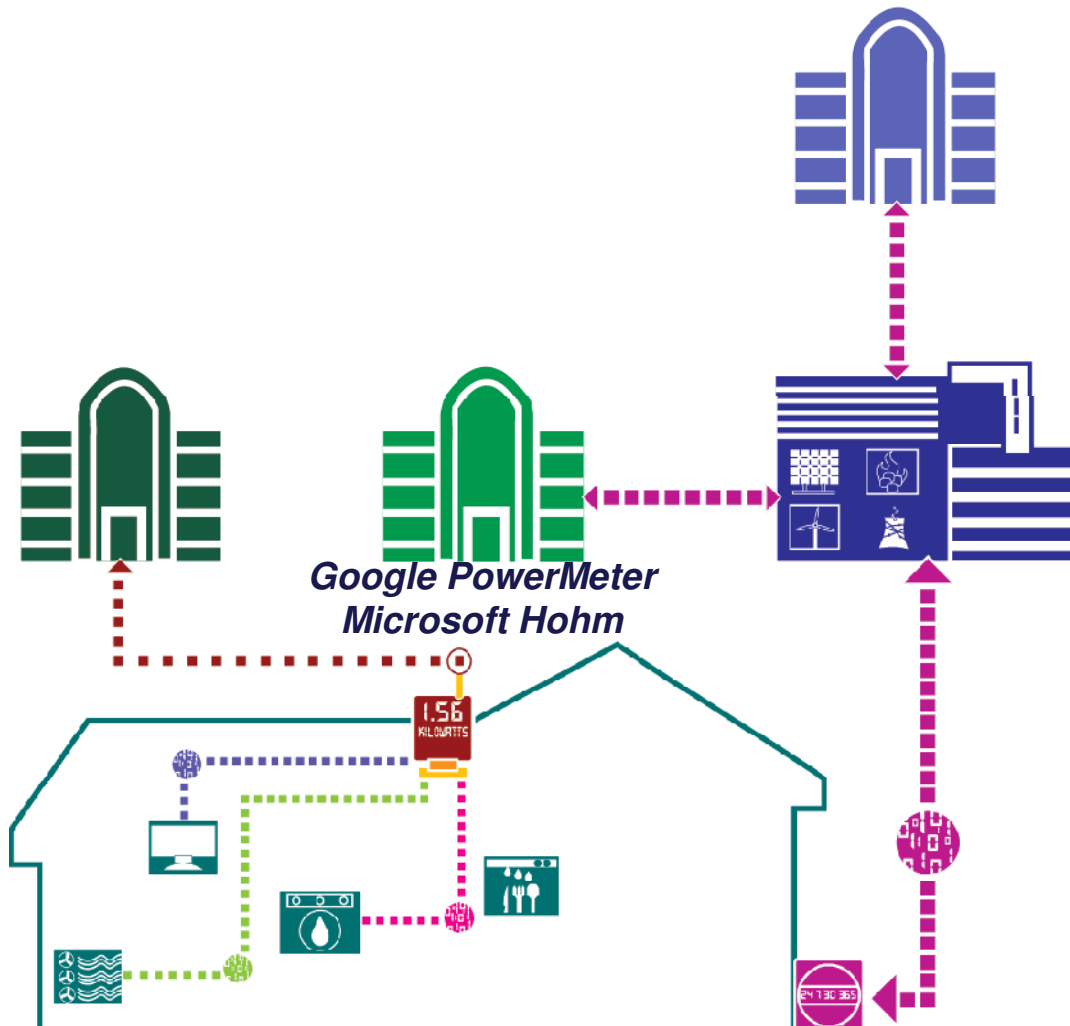
§6. Use & Disclosure Limitation



(b): Utilities “may collect, store and use covered information for primary purposes without customer consent.”

(b): Third parties “may collect, store and use covered information only with prior customer consent. *Exception:* utilities may disclose info when ordered to do so by the Commission or for a primary purpose being carried by contract on behalf of the utility

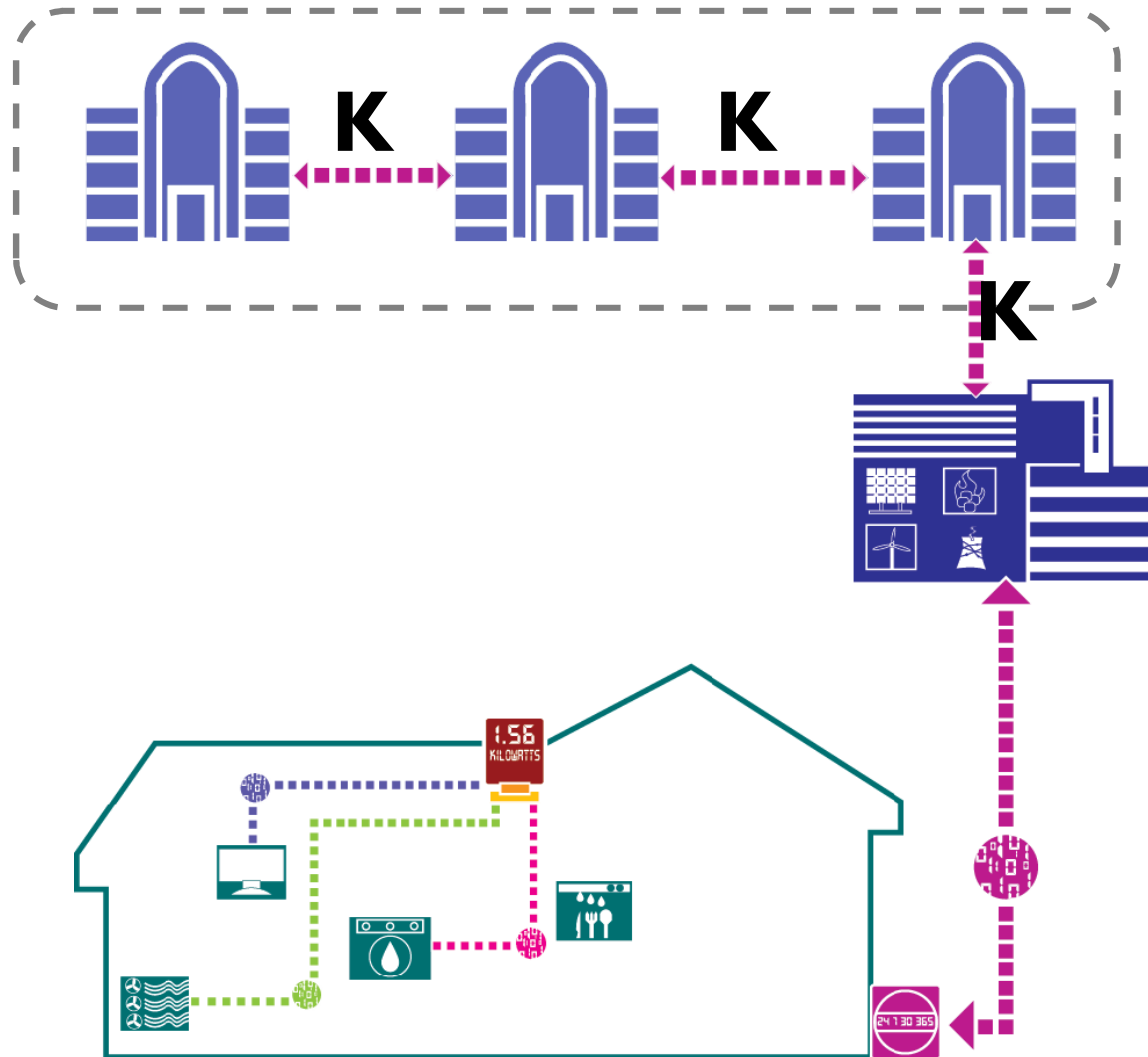
§6. Use & Disclosure Limitation



(c)(1): No customer consent required “for a primary purpose being carried out under contract with and on behalf of the entity disclosing the data.”

Contractor (light blue building)
must adhere to CPUC policies.

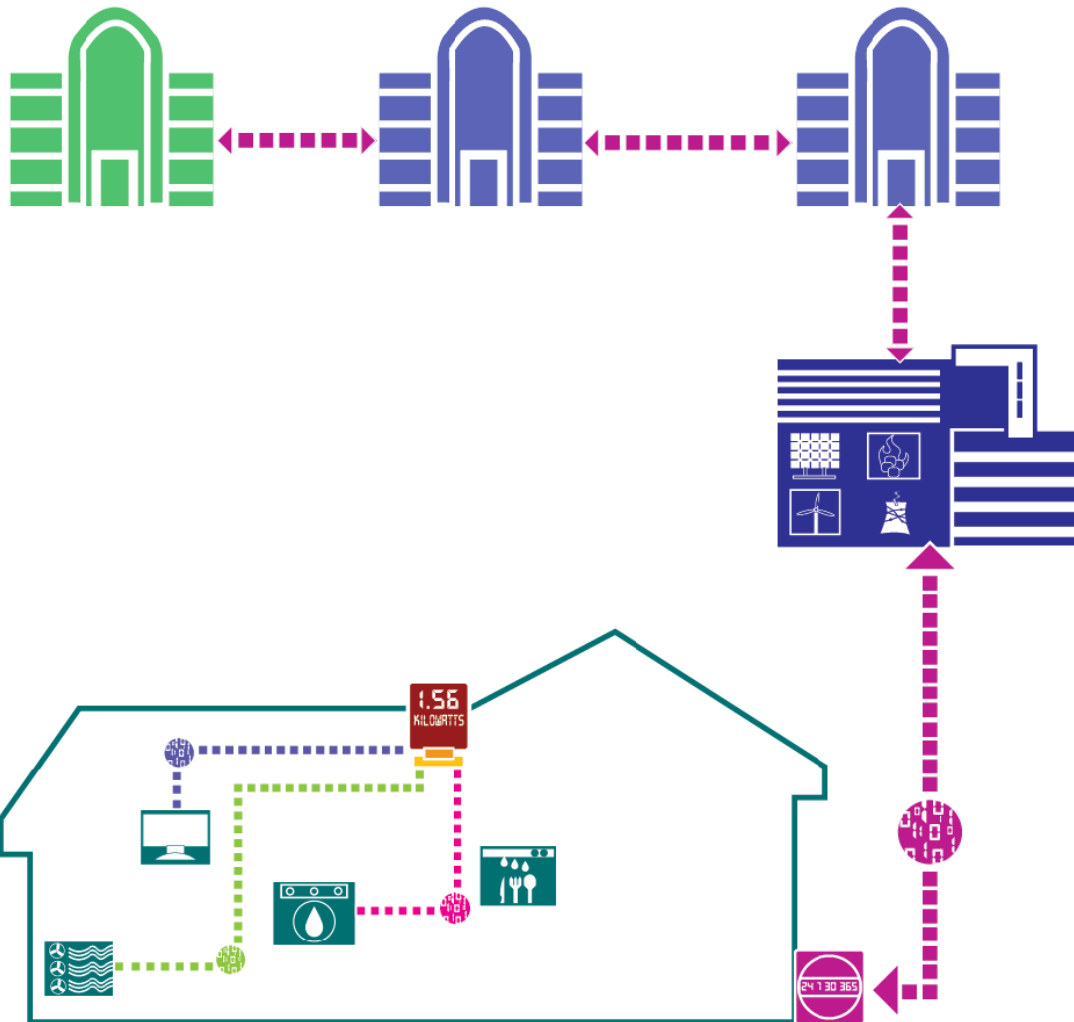
§6. Use & Disclosure Limitation



Contract chain

(c)(2): “Any entity that receives covered information derived initially from a covered entity” may share data without customer consent for primary purposes. All must adhere to CPUC’s policies via contract.

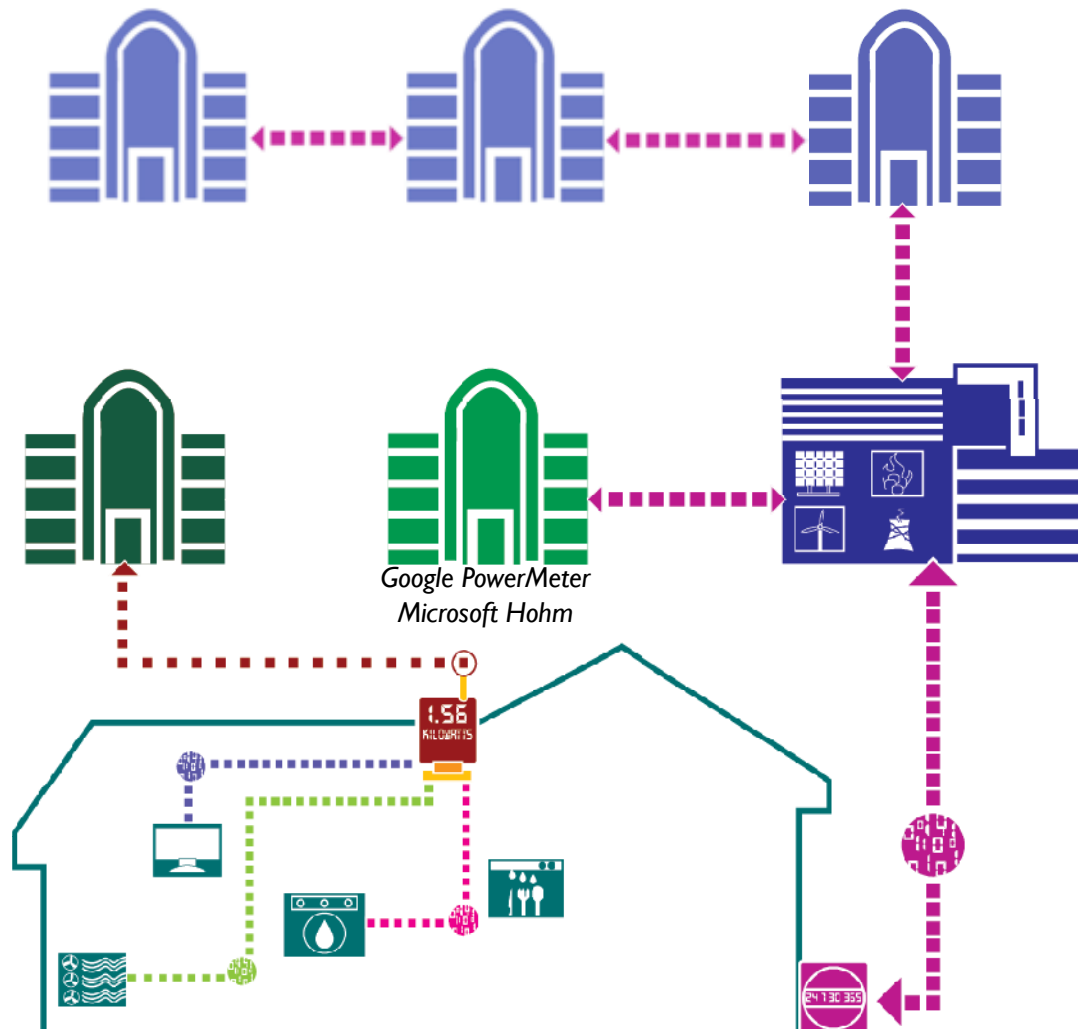
§6. Use & Disclosure Limitation



(d): Customer consent is always required to disclose covered information for any secondary purpose.

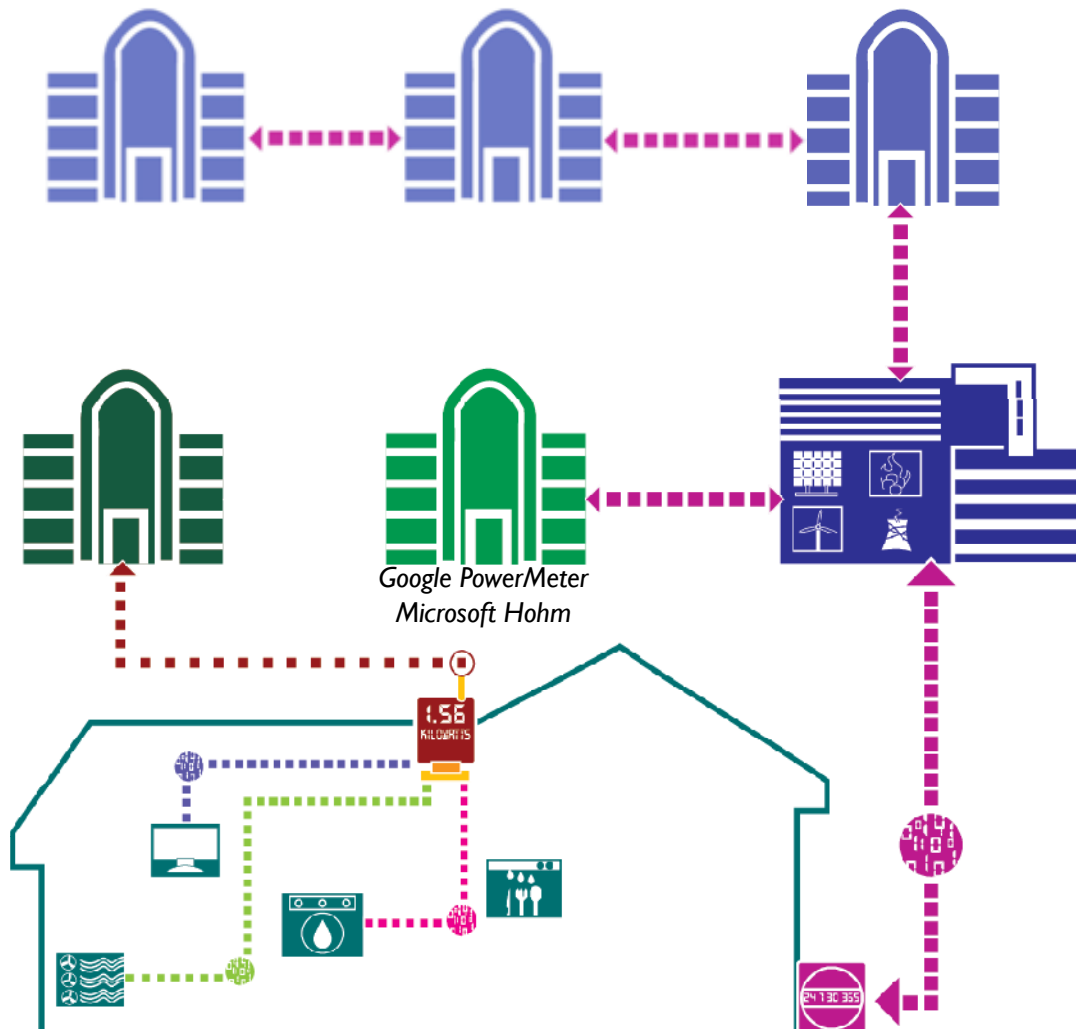
(e): Customers can revoke authorization at any time.

§7. Data Quality & Integrity



Must ensure “covered information [...] is reasonably accurate and complete.”

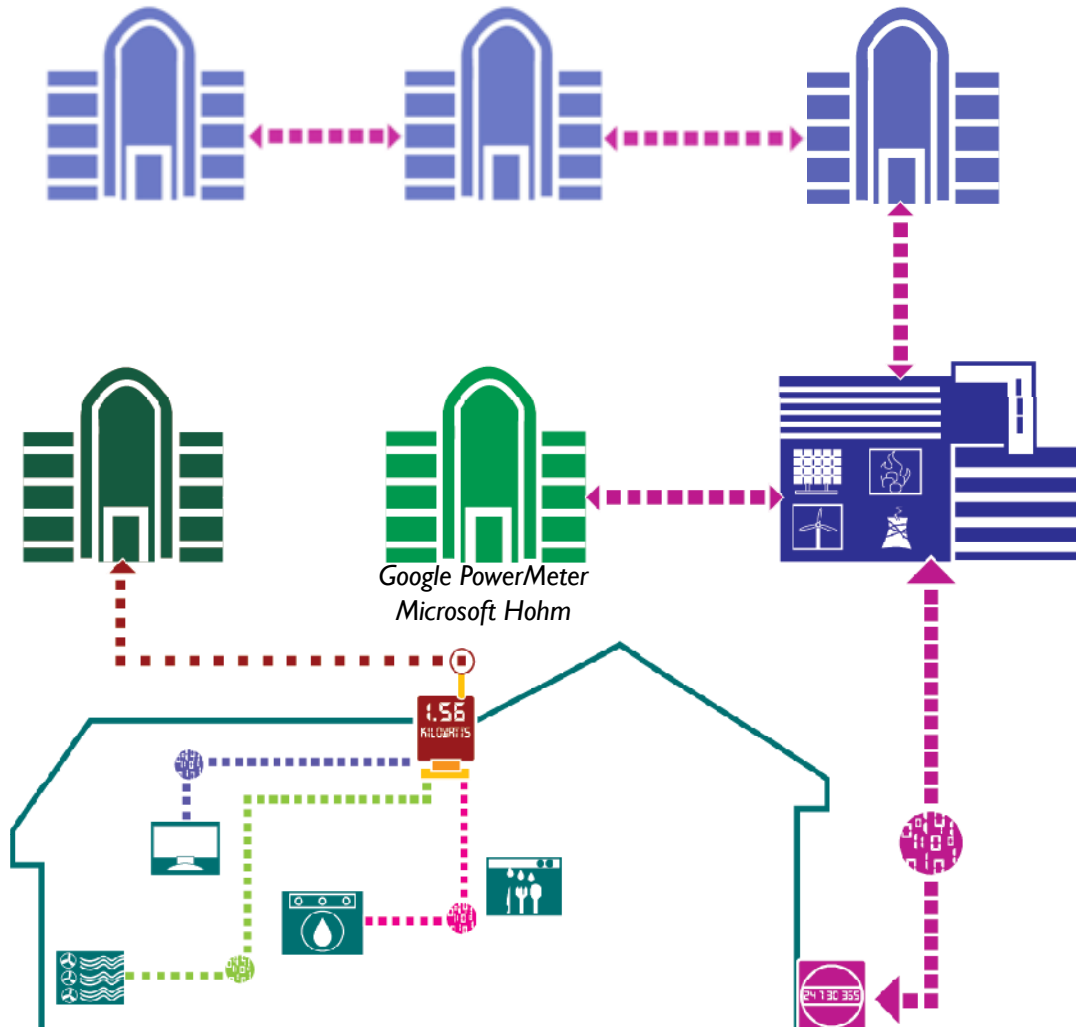
§8. Data Security



(a): “reasonable administrative, technical, and physical safeguards to protect covered information.”

(b) Required to provide notification of breach

§9. Accountability & Auditing



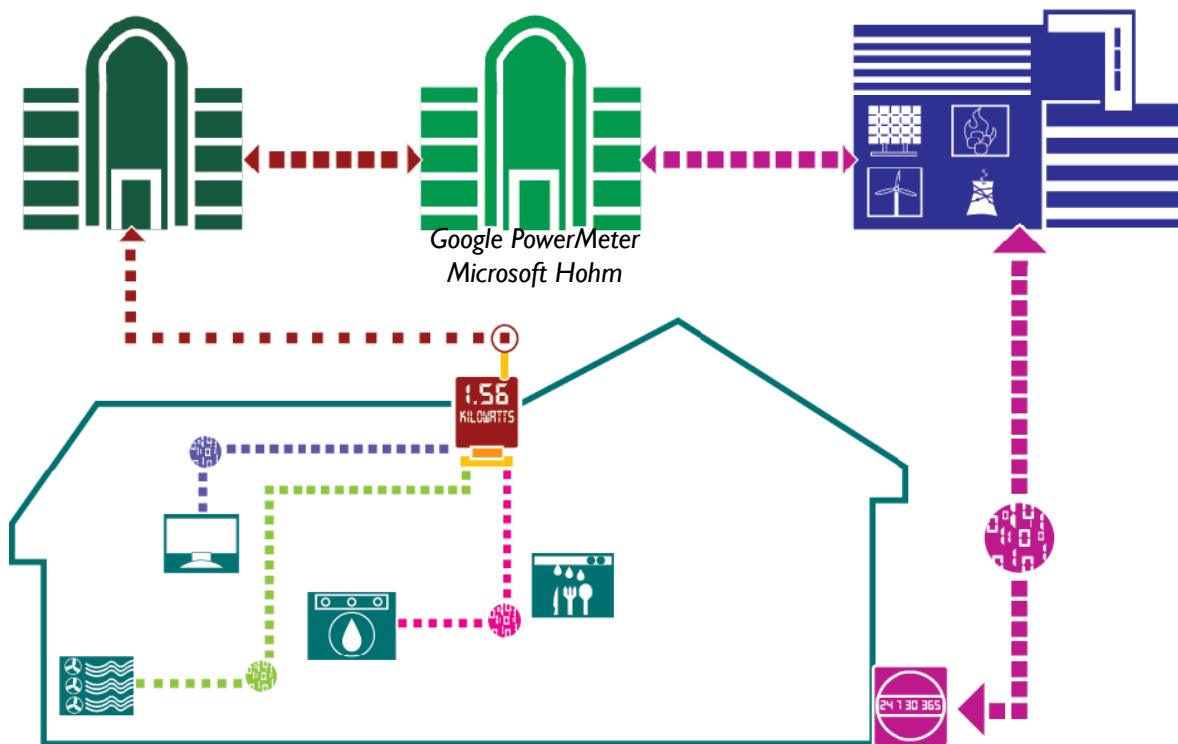
(a): must make available to the Commission:

(1) privacy notices

(2) their internal privacy and data security policies

(3) third parties to which they disclose covered information, the purposes for which that information is disclosed

§9. Accountability & Auditing



(d): Electrical corporations must do audits.

(e)(1): Must report “the number of authorized third parties accessing covered information.”

- ☐ **Privacy in the home**
- ☐ **Jurisdictional Issues**
- ☐ **Engagement with other State and Federal Actors**
- ☐ **Relationship between privacy rules and innovation**
- ☐ **Technical Implementations of DR and LC can make privacy easier or harder to address**

References



Title		Link
1	Mulligan, Deirdre K., Wang, Longhao and Burstein, Aaron J., Privacy in the Smart Grid: An Information Flow Analysis, On behalf of California Energy Commission, Public Interest Energy Research Group, March 1, 2011. Available at SSRN:	http://ssrn.com/abstract=1815605
2	P.A. Subrahmanyam, D. K. Mulligan, D. Wagner, U. Shankar, E. Jones, J. Lerner. "Network Security Architecture for Demand Response/Sensor Networks". Technical report, On behalf of California Energy Commission, Public Interest Energy Research Group, January, 2005.	<ul style="list-style-type: none"> • http://sites.energetics.com/MADRI/toolbox/pdfs/standards/network_security_final_report.pdf • http://www.law.berkeley.edu/4727.htm
3	Lerner, Jack I. and Mulligan, Deirdre K., Taking the 'Long View' on the Fourth Amendment: Stored Records and the Sanctity of the Home. Stanford Technology Law Review (STLR), Vol. 3, 2008. Available at SSRN:	http://ssrn.com/abstract=1099121
4	Proposed Decision Adopting Rules to Protect the Privacy and Security of Electricity Usage Data of the Customers of Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company, in Rulemaking 08-12-009, California Public Utilities Commission, filed May 6, 2011	http://docs.cpuc.ca.gov/EFILE/PD/134875.pdf
5	Comments of the Center for Democracy & Technology, on Draft NIST Interagency Report (NISTIR) 7628, Smart Grid Cyber Security and Requirements, National Institute of Standards and Technology, Dec. 1, 2009	http://www.cdt.org/content/cdt-comments-nist-smart-grid

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